

A diverse group of compounds – some types are:

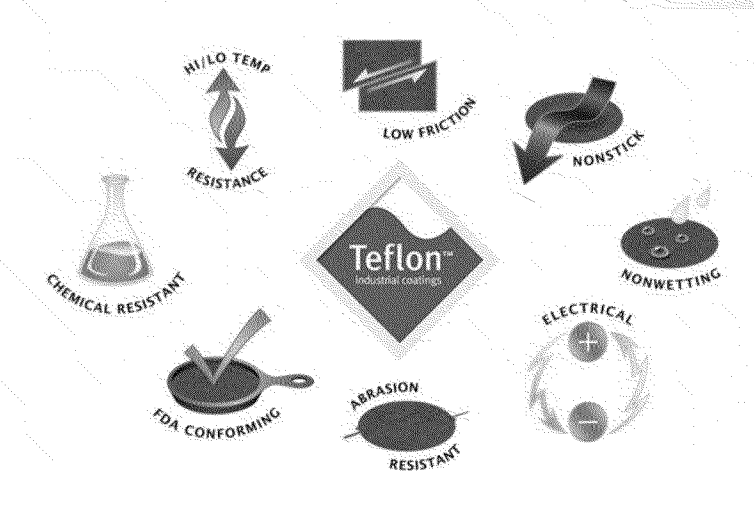
- Long-chain perfluoroalkyl carboxylic acids (PFCAs) with eight or more carbons, including PFOA, and
- Perfluoroalkane sulfonates (PFSA) with six or more carbons

Used for decades in hundreds of industrial applications and consumer products- carpeting, apparels, upholstery, food paper wrappings, fire-fighting foams and metal plating - unique surfactant properties and stability - Teflon, Scotch Guard, GorTex.

Found in the environment and in people.

- **Persistent**, resist degradation and **bioaccumulate**.

High concentrations to PFOA and PFOS have been **linked to adverse health effects** in laboratory animals and people.



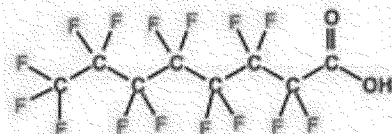
Some desirable characteristics of PFAS chemicals.

- ✓ **Scope of the problem – aware of what we do and do not know.**
- ✓ **Actions taken and how they support statute(s)**
- **Next steps**
- **Internal and external interactions and collaborators**
- **Impact and success rate**

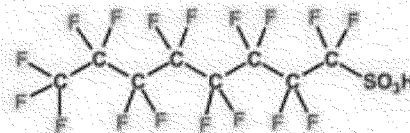
- ✓ Proceeding
- Needs Attention
- To be determined

✓ PFAS - Scope of the Problem

We know a lot about two, some about a few, and not much about hundreds more.



PFOA - perfluorooctanoic acid



PFOS - perfluorooctanesulfonic acid

- ✓ Human health toxicity
- ✓ Exposure
- ✓ Analytical methods
- ✓ Risk management
- ✓ Risk communication
- ✓ Statutes
 - ✓ OPPT
 - OW
 - OLEM
 - Regions
 - ORD

- ✓ Proceeding
- Needs Attention
- To be determined

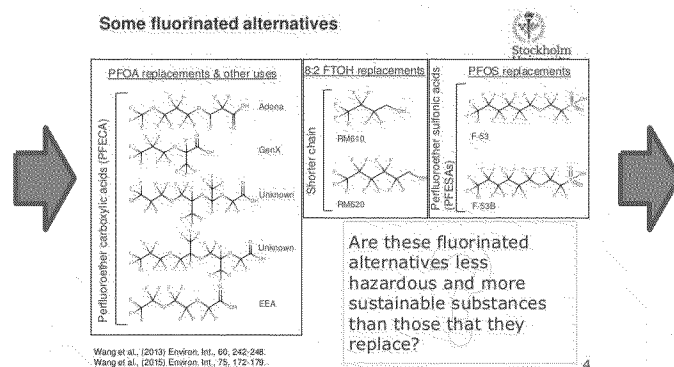


✓ PFAS - Scope of the Problem

We know a lot about two, some about a few, and not much about hundreds more.



PFAS other than PFOA and PFOS



- Human health toxicity
- Exposure
- Analytical methods
- Risk management
- Risk communication
- Statutes
 - OPPT
 - OW
 - OLEM
 - Regions
 - ORD

- ✓ Proceeding
- Needs Attention
- To be determined



OCSP: Actions taken

- **EPA's New Chemicals Program**

- Reviewed hundreds of pre-market alternatives for PFOA and related chemicals since 2000 before they enter the marketplace

- **Significant New Use Rule (SNUR)**

- Proposed on January 21, 2015 to require manufacturers (including importers) and processors of PFOA and related chemicals, including as part of articles, to notify EPA at least 90 days before starting or resuming new uses of these chemicals in any products.

- **PFOA Stewardship Program**

- Eight companies participated in the program and successfully eliminated production of PFOA.
- Designed to phase out PFOA and related per- and polyfluoroalkylated substances (PFAS) including potential PFOA precursors by these companies by the end of 2015.



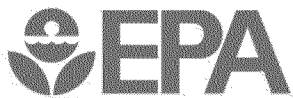
OLEM: Actions taken

- **EPA Federal Facility Superfund Program**
 - Actively engaged in PFAS cleanup process at 30 Federal Facility National Priority List (NPL) Sites.
 - PFAS detections in groundwater ranges from non-detected/slightly exceeding the Drinking Water Health Advisory of 70 ppt (PFOA and PFOS combined) to 2,000,000 ppt.
 - Drinking water impacted at 13 of these Federal Facility NPL Sites.
- **Office of Superfund Remediation and Technology Innovation (OSRTI)**
 - 12 known impacted NPL sites, including one proposed for listing (St. Gobain Hoosick Falls, NY)
 - 100s potential NPL sites (e.g. 100 metal plating sites, 300 landfills)
- **Regional Assistance**
 - Holding site specific consultations with Regions on investigations of PFAS contamination.



OW: Actions taken

- **Published Drinking Water Health Advisories (HA) in 2016 for PFOA and PFOS**
 - non-regulatory information for federal, state and local officials to consider when addressing drinking water contamination
 - Identified 0.07 µg/L (70 parts per trillion) as the HA level for PFOA and PFOS combined and provided information about treatment and monitoring.
- **Evaluating PFOA and PFOS for regulatory determination under the Safe Drinking Water Act (SDWA).**
 - PFOA and PFOS are on the fourth Contaminant Candidate List (CCL 4) published in November 2016. OW is assessing PFOA and PFOS against the three SDWA regulatory determination criteria:
 - *may have an adverse effect on the health of persons;*
 - *is known to occur or there is a substantial likelihood that it will occur in public water systems with a frequency and at levels of public health concern;*
 - *In the sole judgment of the Administrator, regulating the contaminant presents a meaningful opportunity for health risk reductions for persons served by public water systems.*
 - OW planning to brief the Administrator in 2018 to obtain option selection for a preliminary regulatory determination
 - EPA must decide whether or not to regulate at least 5 CCL4 contaminants by January, 2021.
 - Preliminary regulatory determinations for public comment expected in 2019



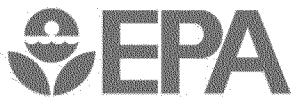
ORD: Actions Taken

- **EPA has been studying exposure and health effects of PFAS for more than 15 years.**
- **Health Effects**
 - Compiling considerable knowledge on the toxicological effects of PFOA and PFOS, including studies on the fate of PFAS in the body, and
 - Conducting research to study the potential hazards of PFAS in the environment using computational toxicology modeling.
- **Analytical Methods/Exposure Assessment**
 - Ongoing research on analytical methods, in collaboration with program and regional offices, for measurement of PFAS in environmental media, and
 - Evaluating sources, environmental fate and transport, and exposure to human and non-human receptors.
- **Risk assessment**
 - EPA's Provisional Peer-Reviewed Toxicity Value (PPRTV) program completed a health assessment for perfluorobutane sulfonate (PFBS), a substance similar to PFOA and PFOS, in 2014.
 - EPA identified PFAS as a chemical class of interest to the Agency in the 2015 multi-year agenda for the Integrated Risk Information System (IRIS) program.
- **Risk Management**
 - Characterize PFAS contamination in the soil, surface water, and groundwater at military installations where aqueous film forming foams (AFFF) have been used extensively
 - With the Air Force Institute of Technology (AFIT), test in situ remediation technologies to remove PFAS at contaminated sites.



Regions: Actions Taken

- **PFAS have been identified as an important issue in the Regions. Below are the general, ongoing efforts in the Regions.**
 - Working collaboratively with states, local and federal partners, particularly DOD, to address concerns with PFAS contamination of public and private drinking water wells and legacy contamination at Superfund sites.
 - Providing support to states on different issues, including direct analytical support for sites, method improvement, method validation studies and quality assurance protocols. (examples: R1 and New Hampshire; R4 and North Carolina)
 - Assisting states, local agencies and federal facilities with public messaging regarding risks.
 - Regions have had to issue Safe Drinking Water Act Administrative Orders to federal facilities (Pease AFB, NH and Warminster Navy Base, PA) in order to protect public supply wells given the emergent nature of this class of chemicals and the slow reaction time of other federal agencies.
- **Regional laboratory representatives participate in national and regional programmatic meetings offering technical advice with expertise in analytical methodology and quality acceptability.**



PFASs Analytical Methods - Next steps

- **Drinking Water (DW): EPA Method 537 Version 1.1**
 - Six PFASs for 3rd Unregulated contaminants monitoring rule (UCMR3)
- **Non-DW: No EPA method currently exists**
 - Each contract lab has their own method
 - Performance data needed similar to Method 537
 - Data from different labs may not be comparable
 - QA/QC from Method 537 should be included regardless
- **New EPA Method for non-DW matrices under development**
 - OLEM, OW, and ORD conducting a multi-lab validation effort
- ***PFAS precursors - ORD, Region 5, and others also developing non-DW methods (surface waters, groundwaters, wastewater, biosolids, soils, sediments, etc)***



EPA PFAS Methods Validation Next Steps

Method Validation for ground, surface, and wastewaters

- **24 PFASs** (*including all target analytes in EPA Method 537*)
- **Methods under consideration** (*all using LC/MS/MS*)
 - Direct injection
 - Solid phase extraction
 - Target detection limits of 10's ng/L
- **Direct injection method up first**
 - Follows draft ASTM Method D7979 developed by EPA Reg 5
 - Phase 1: 5 internal (EPA) lab validation (Commenced in April 2017)
 - Phase 2: 5 external lab validation (Late May/Early June 2017)
- **Schedule:** Publish draft method in fall 2017





Current PFAS Activities: Cross-Agency

- **ORD and OLEM lead a cross-EPA workgroup on characterizing human health hazards**
 - to characterize the available toxicity information for approximately 30 PFAS of interest to various program offices or regions;
 - to develop quantitative toxicity values for multiple PFAS, other than PFOA and PFOS; and
 - to inform evidence-based decisions by EPA offices and regions regarding potential human health risks from ongoing or future exposures.
- **OLEM/Region 3/ORD lead a cross-EPA workgroup on method development and validation**
 - to develop multi-laboratory validated methods for analyzing sample types other than drinking water (waters and solids) and quantifying 24 PFAS. Currently performing a multi-lab validation of a method for the 24 PFAS which was developed by the Region 5 Chicago Regional; and
 - to develop sampling protocols to address PFAS analytical data quality issues Regions have identified.
- **Region 10 and Region 3 lead a cross-EPA workgroup on evaluating data quality issues**
 - to develop guidelines for data deliverables and assessment criteria.



Cross-Agency Coordination of PFAS Activities

- PFAS is **a cross-Agency** issue involving:
 - OLEM, OW, OCSPP
 - OECA, OGC
 - Every Region
 - Public Affairs
 - Policy
 - PFAS knowledge gaps are **multifaceted**, involving:
 - Human health toxicity
 - Exposure
 - Analytical methods
 - Risk management
 - Risk communication
 - **Stakeholders** include:
 - PRPs and water utilities
 - State and Tribal Agencies
 - NGOs
 - Public
- There are three cross-Agency workgroups
 - Human health toxicity
 - Analytical Methods
 - Quality Assurance and Validation
 - OSA has been asked to lead a x-agency coordination committee with executive leaders representing OCSPP, OLEM, OW, ORD, and Regions:
 - Coordinate emerging and emergency cross-agency issues
 - Establish priority activities, products, and inform data gaps
 - Identify key technical milestones and deadlines
 - Establish and track progress
 - Align resources with priorities and milestones
 - Coordinate EPA review and approval
 - Review and approve EPA communications in coordination with OPA
 - Establish a centralized point of contact with stakeholders